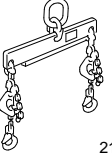
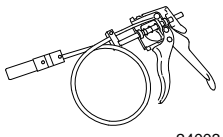


Engine – Remove and Install (21 134 0)

Special Tools

 <p>21-068A</p>	<p>21-068A Engine lifting tackle</p>
 <p>24003</p>	<p>24-003 Remover/installer, radiator hose clip</p>

Materials

Thread-locking compound	SDM-M4G9107-A
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Workshop Equipment

Transmission jack
Trolley jack

Remove

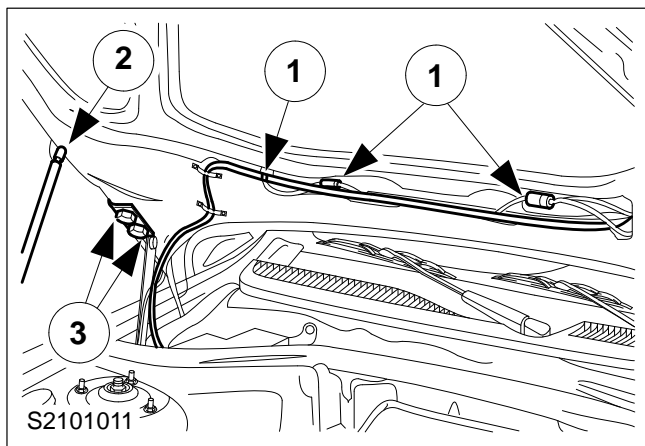
1. Preparatory operations.

- Make a note of the radio keycode.
- Make a note of the preset radio stations.



CAUTION: Disconnect the battery earth lead.

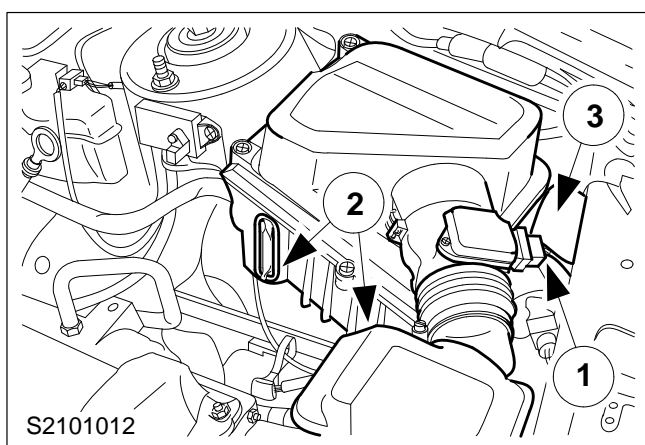
NOTE: When removing and installing coolant or breather hoses use Remover/Installer 24-003 as required.



2. Detach the hood.

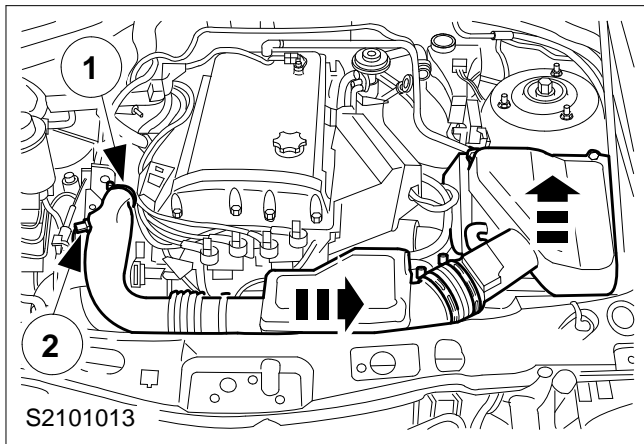
Detach the hood sound-damping matting.

- 1 Disconnect the hose and the washer system plug and unclip them.
- 2 Unclip the hood damping strut.
Unclip the retaining ring.
- 3 Remove the hood retaining bolts.



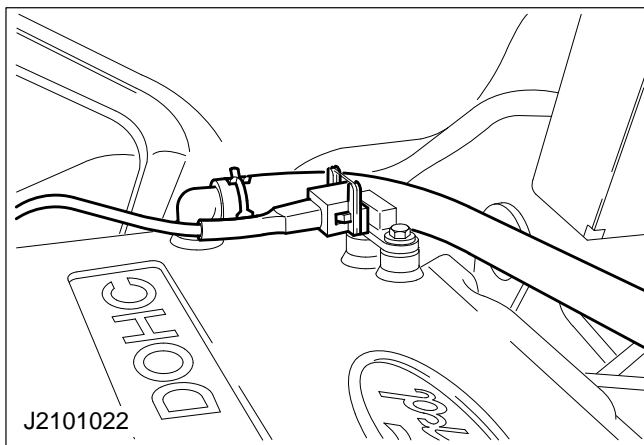
3. Remove the air cleaner with the intake pipe.

- 1 Disconnect the mass air flow (MAF) sensor multiplug.
- 2 Unclip the rubber mountings.
- 3 Detach the intake connector.



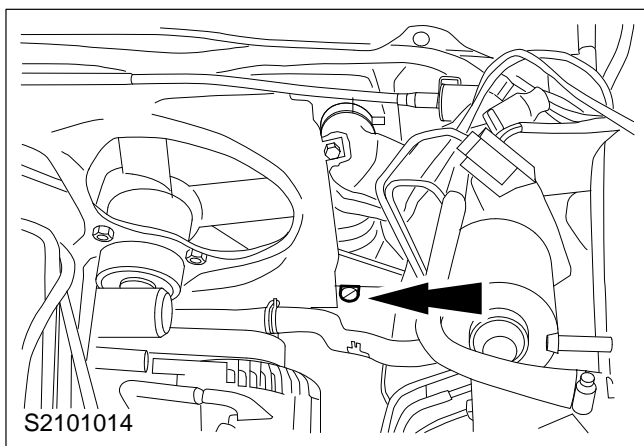
4. Remove the air cleaner with the intake pipe (continued).

- 1 Detach the hose clip.
- 2 Disconnect the multiplug from the intake air temperature sensor (IAT sensor).



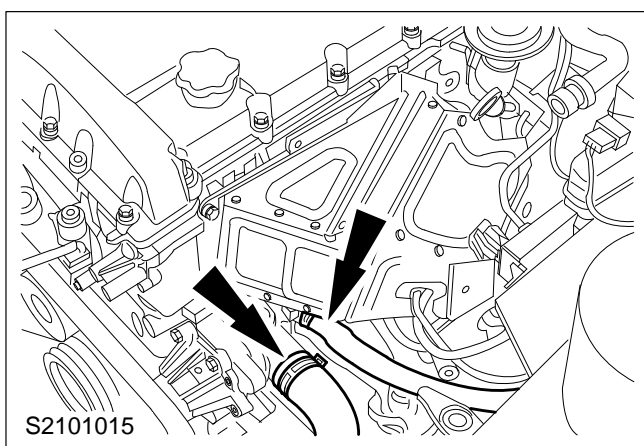
5. Detach the engine breather hose (PCV).

6. Disconnect the multiplug from the camshaft position sensor (CMP sensor).

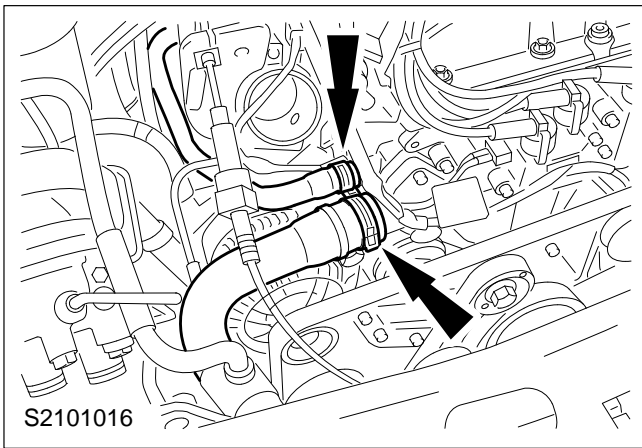


7. Drain off the coolant.

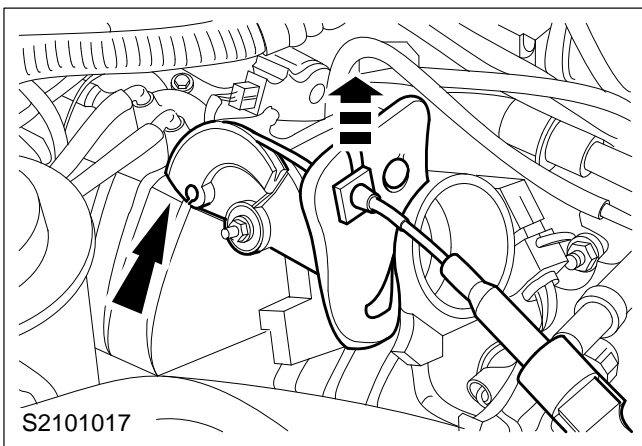
Detach the front engine undershield.



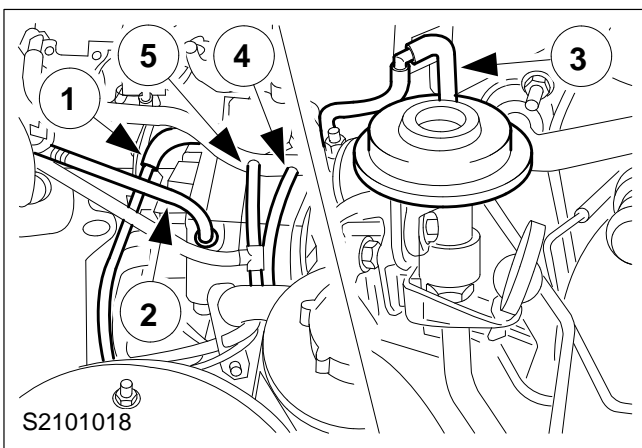
8. Detach the coolant hoses from the coolant pump.



9. Detach the coolant hoses from the thermostat housing (continued).

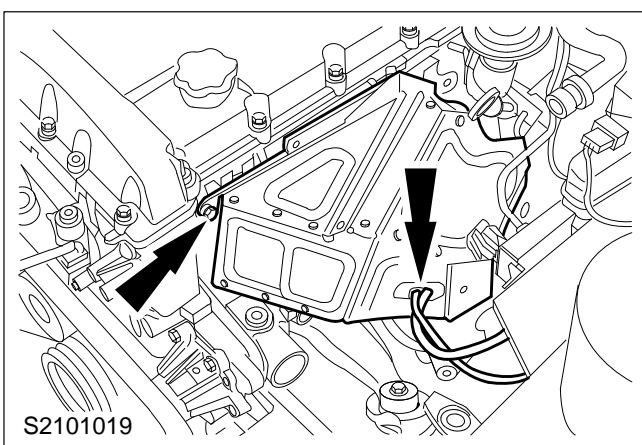


10. Detach the accelerator cable.



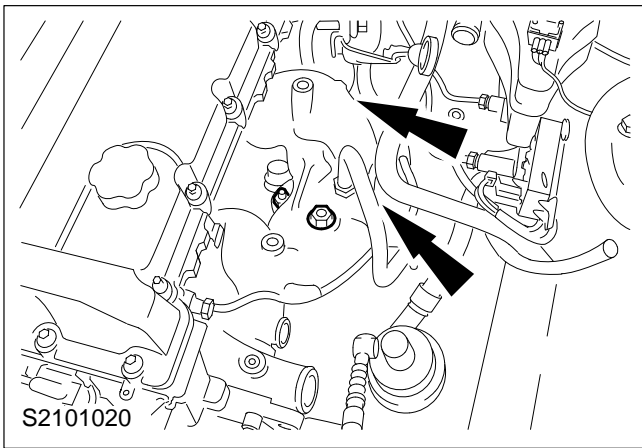
11. Disconnect the vacuum hoses.

- 1 From the idle air control (IAC) valve.
- 2 To the brake servo.
- 3 From the EGR valve.
- 4 From the EGR system vacuum controller (CVT).
- 5 To the evaporative emission control system (EVAP system) valve.



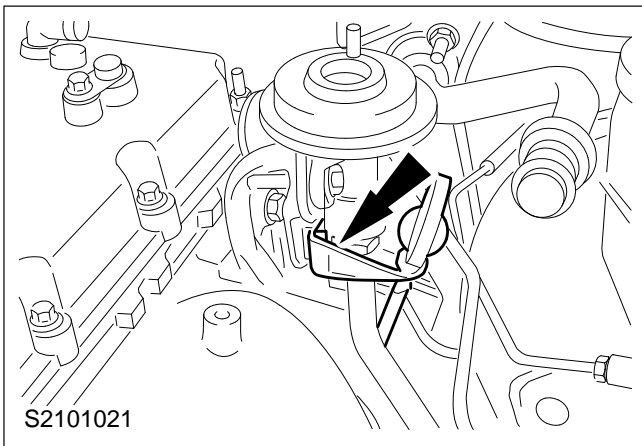
12. Detach the exhaust manifold heat shield (three bolts, one nut).

Disconnect the two vacuum hoses to the differential pressure feedback EGR (DPFE sensor).



13. Detach the catalyst from the exhaust manifold (four nuts).

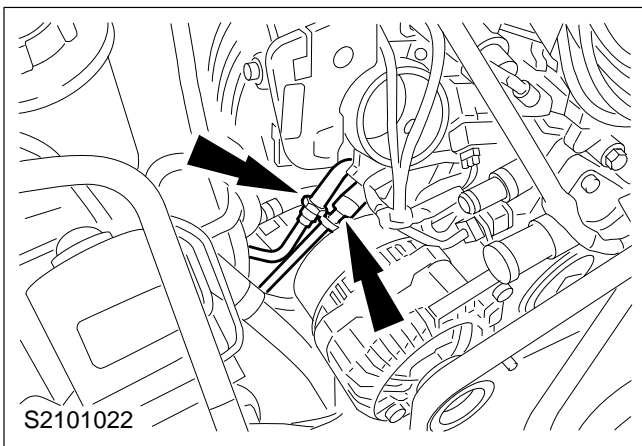
Disconnect the HO2S plug.



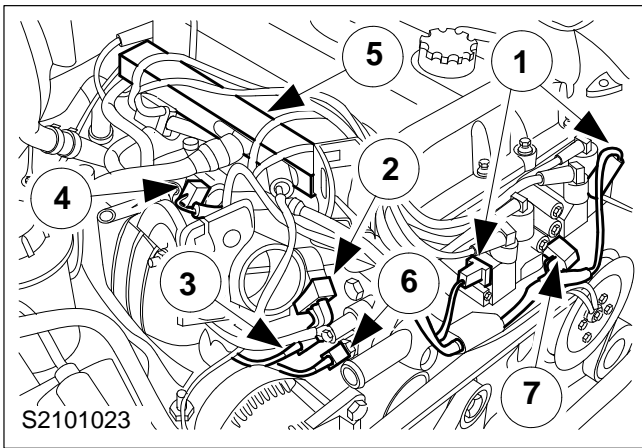
NOTE: Only when the engine is being removed without the transmission.

14. Remove the oil dipstick tube.

Detach the oil dipstick bracket.

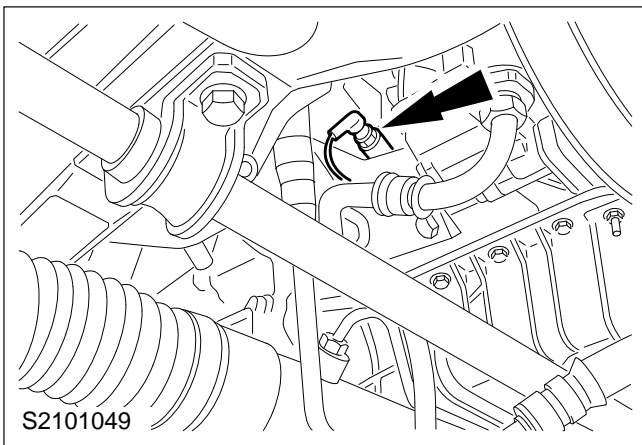


15. Disconnect the fuel lines.

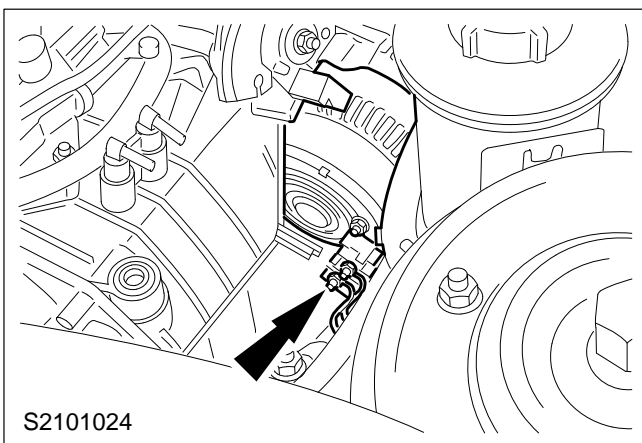


16. Disconnect the engine management multiplugs.

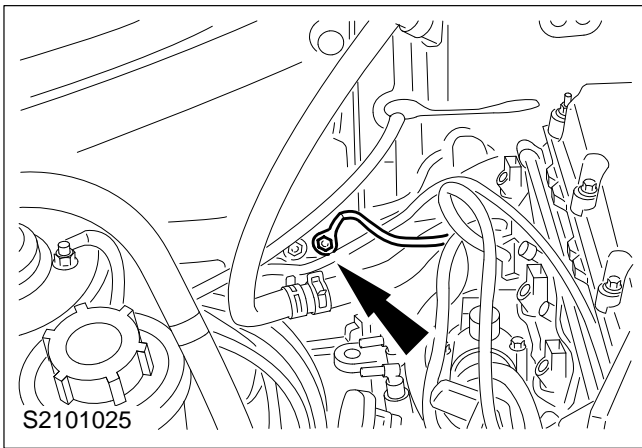
- 1 From the DIS ignition coils.
- 2 From the throttle position sensor (TP-sensor).
- 3 From the engine coolant temperature (ECT) sensor (ECT-Sensor).
- 4 From the IAC sensor.
- 5 Injector wiring rail.
- 6 From the coolant temperature gauge sender unit.
- 7 From the noise suppression capacitor (if fitted).



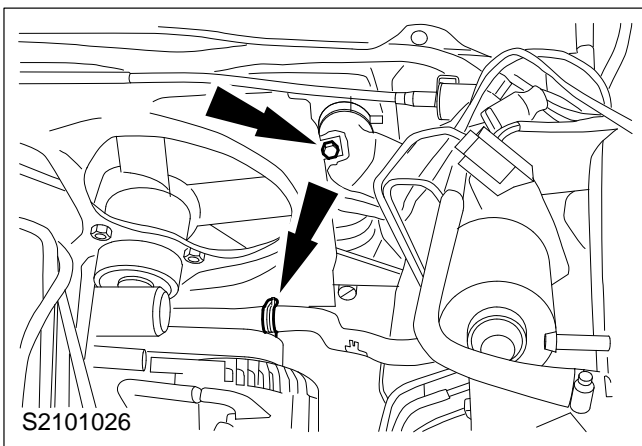
17. Disconnect the oil pressure switch multiplug (shown from below).



18. Disconnect the alternator.

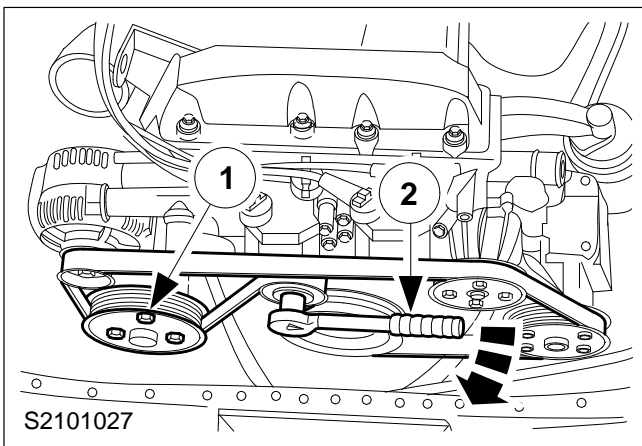


19. Detach the earth lead from the bulkhead.



20. Detach the air baffle and the fan motors from the radiator.

- Unhook the coolant hose.
- Disconnect the two fan motor plugs.

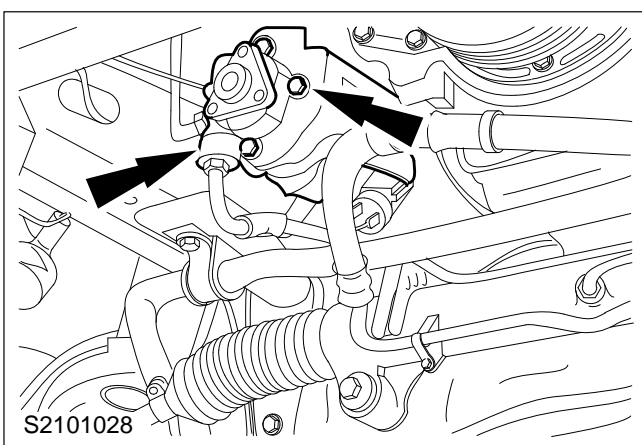


21. Remove the power steering pump.

- 1 Slacken the bolts of the belt pulley.
- 2 Remove the multi-groove belt.

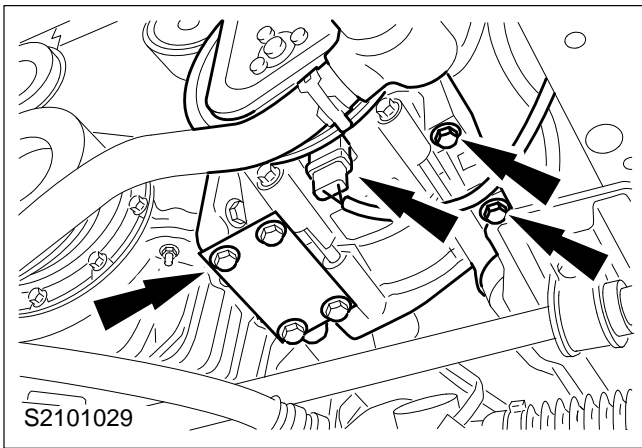
- Detach the belt pulley.
- Raise the vehicle.

22. Detach the rear engine undershields (if present).



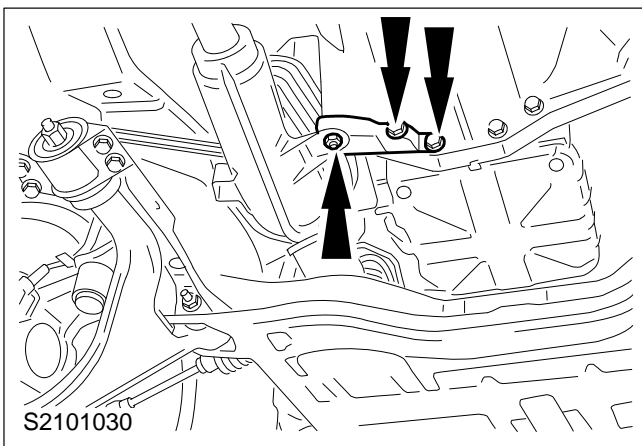
23. Remove the power steering pump (continued).

Unscrew the three bolts from the front and the single bolt from the rear.

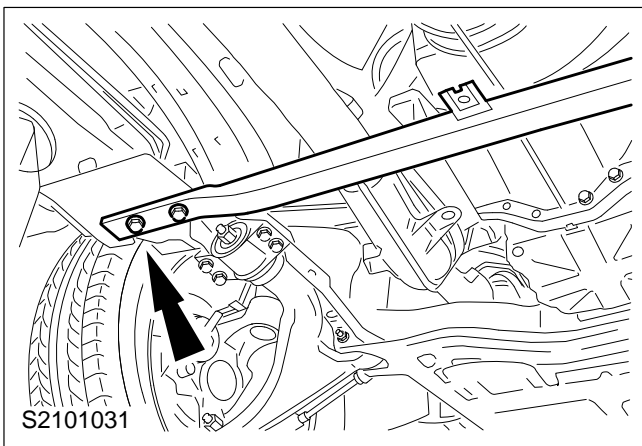


24. Detach the air conditioning compressor and tie it up to one side.

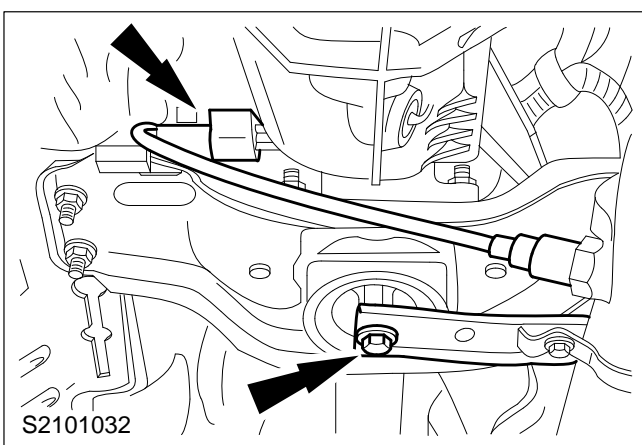
Disconnect the plug from the magnetic clutch.



25. Detach the exhaust mounting.



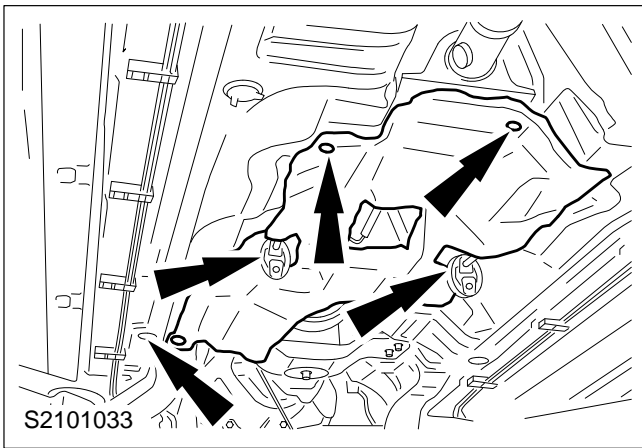
26. Detach the front axle reinforcing bar (left-hand side shown).



27. Detach the exhaust mounting (continued).

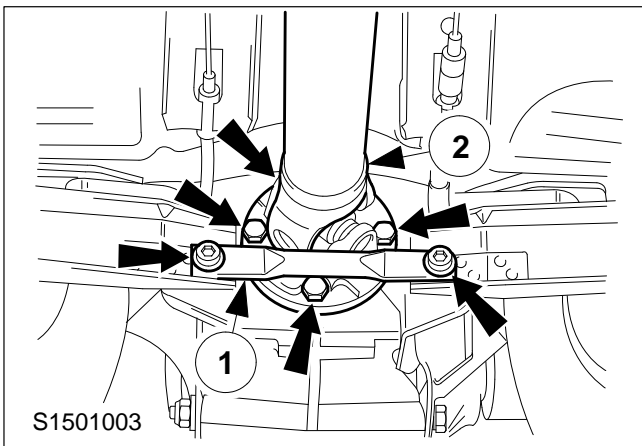
Disconnect the HO2S plug and unclip it.

28. Unhook the exhaust system complete from the rubber insulators.



NOTE: Only when the engine is being removed with the transmission.

29. Detach the exhaust system heat shield.



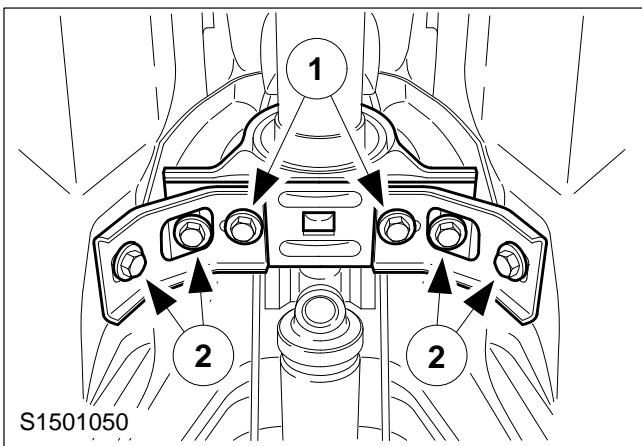
CAUTION: Different length bolts are fitted to the driveshaft for fine balancing. Mark the installation position of the driveshaft and the bolts.

30. Detach the driveshaft from the rear differential.

NOTE: The transverse brace is not fitted on vehicles built from Jan '96.

1 Detach the transverse brace from the rear axle.

2 Detach the driveshaft.



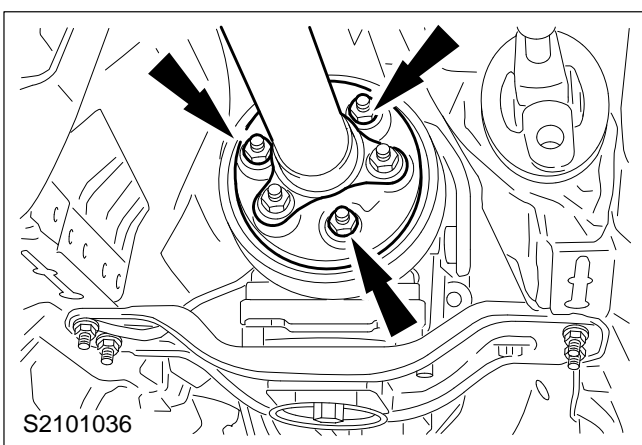
NOTE: Only when the engine is being removed with the transmission.

31. Detach the driveshaft centre bearing.

1 Slacken the bolts.

2 Unscrew the bolts.

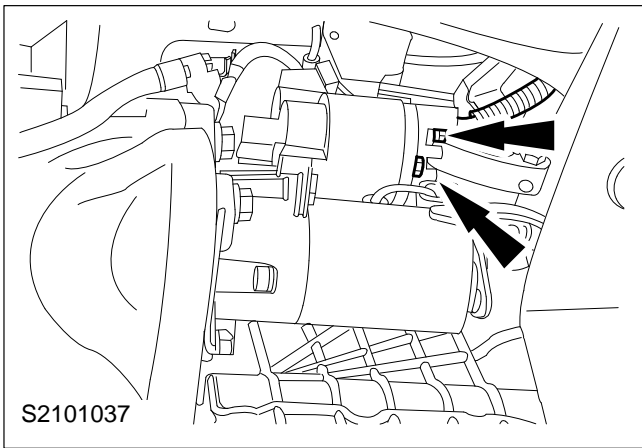
- Turn the two brackets through 90°.
- Take off the spacer washers.



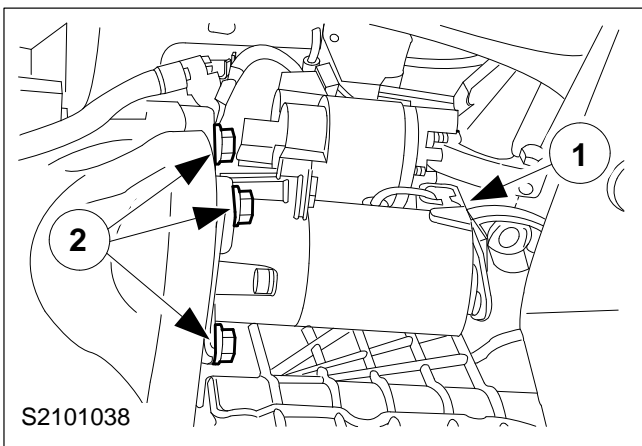
NOTE: Only when the engine is being removed with the transmission.

CAUTION: Do not detach the driveshaft from the rubber doughnut coupling.

32. Detach the driveshaft from the vibration damper.

**33. Disconnect the starter motor.**

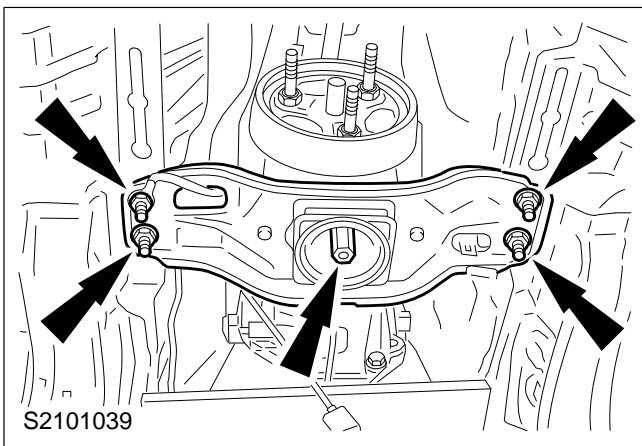
Disconnect the wiring from the solenoid.



NOTE: Only when the engine is being removed without the transmission.

34. Detach the starter motor.

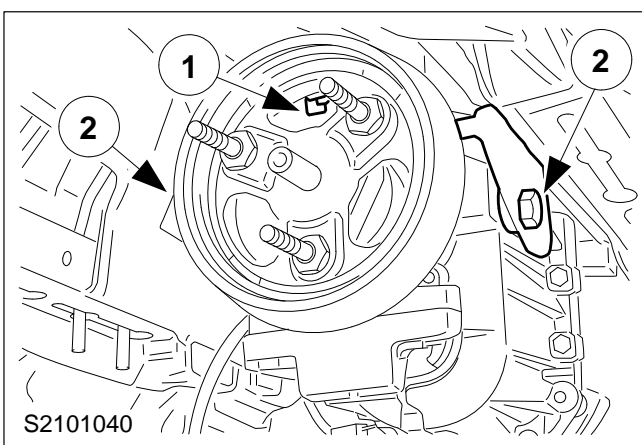
- 1 Detach the starter motor bracket from the engine.
- 2 Remove the flange bolts.



NOTE: Only when the engine is being removed with the transmission.

35. Support the transmission with a transmission jack.**36. Detach the transmission crossmember from the floor assembly.**

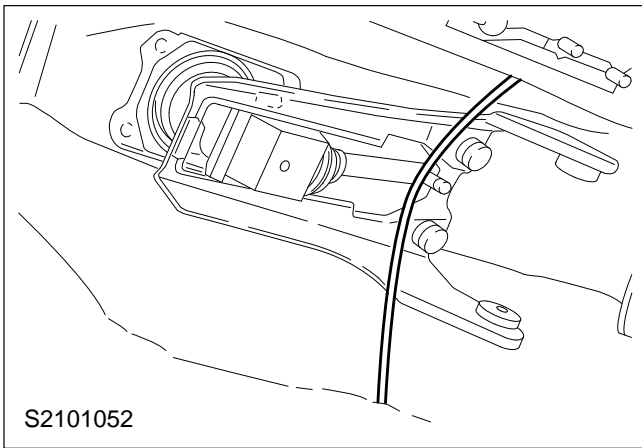
Lower the transmission.



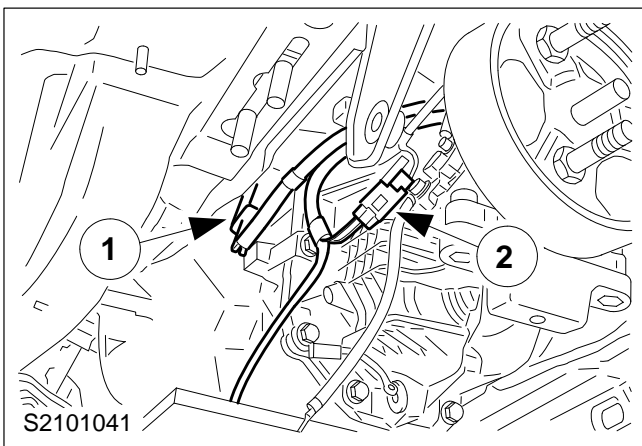
NOTE: Only when the engine is being removed with the transmission.

37. Detach the gearshift support bracket from the transmission.

- 1 Disconnect the gearshift linkage from the coupling.
- 2 Detach the gearshift support bracket (two bolts).



38. Hold the gearshift support bracket in position and support it with a length of round steel rod.

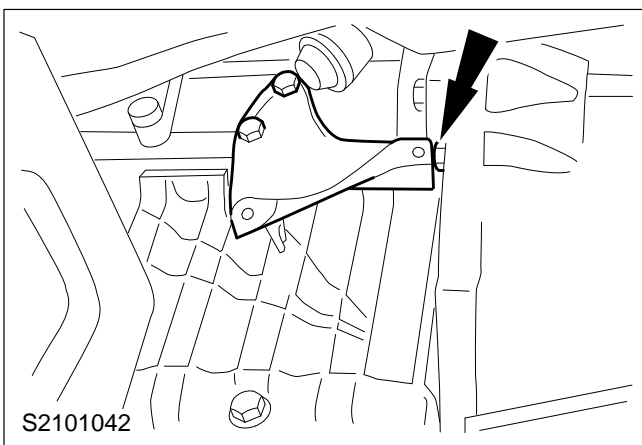


NOTE: Only when the engine is being removed with the transmission.

39. Disconnect the plugs.

- 1 Reversing light switch.
- 2 Vehicle speed sensor (VSS).

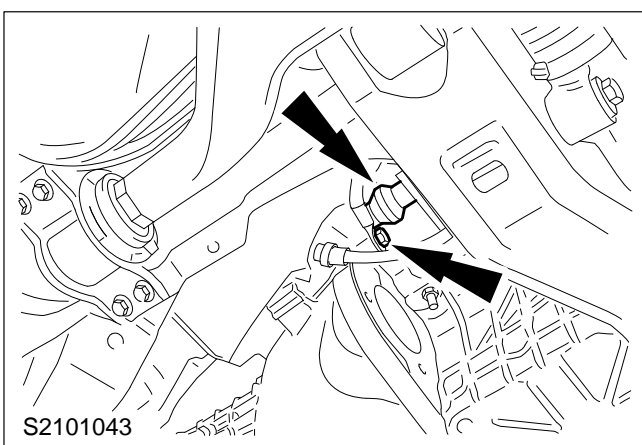
Disconnect the wiring loom completely from the transmission.



NOTE: Only when the engine is being removed without the transmission.

40. Detach the exhaust bracket from the engine.

41. Detach the adaptor plate.

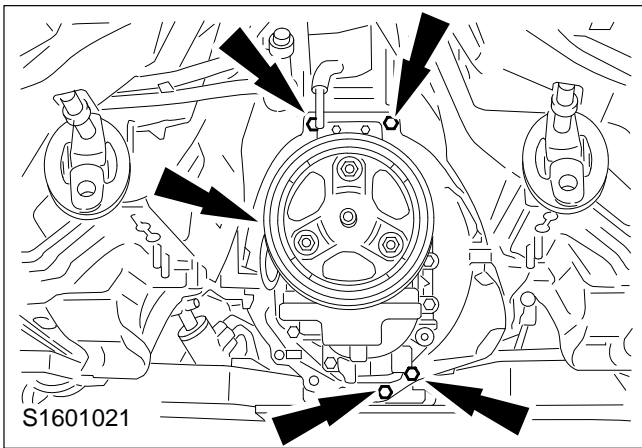


CAUTION: Seal the pipe ends using suitable plugs.

42. Disconnect the line of the hydraulic clutch operating mechanism.

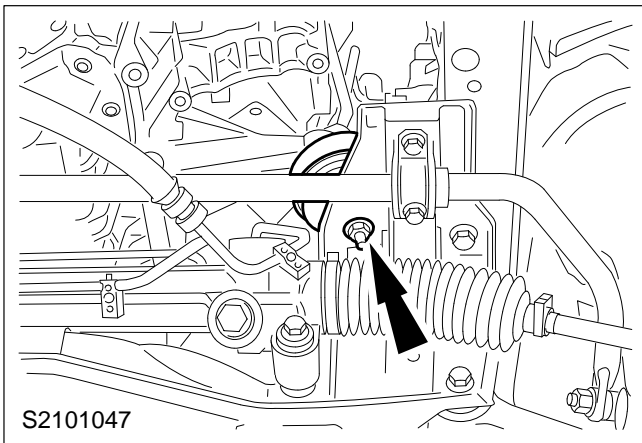
43. Detach the transmission earth lead.

Remove the flange bolt.



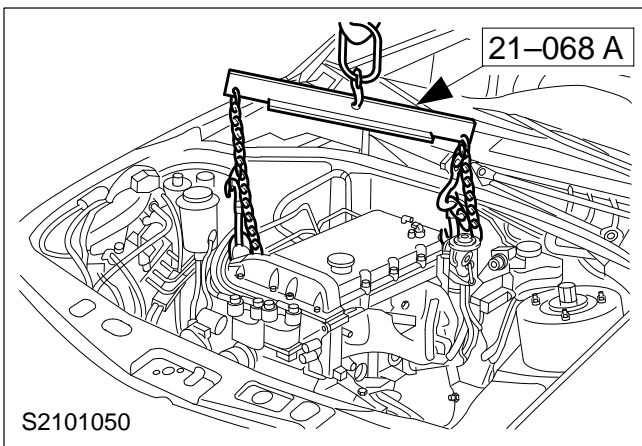
NOTE: Only when the engine is being removed without the transmission.

44. Detach the engine from the transmission.



45. Detach the right and left-hand engine mountings from the axle housing.

- Remove the transmission jack.
- Lower the vehicle.



NOTE: If the engine is being removed without the transmission, the transmission must be supported with a trolley jack.

46. Remove the engine.

Attach the engine lifting bracket.

Install

47. General note.

NOTE: Circlips and self-locking nuts must not be reused.

48. Install the engine or engine and transmission assembly.

Make sure that the engine mountings are correctly located in relation to the axle housing.

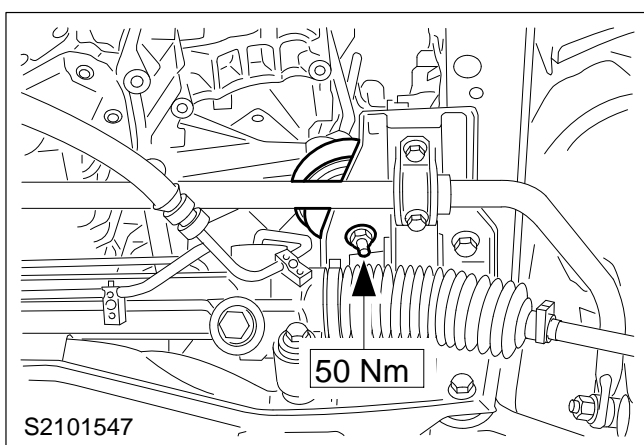
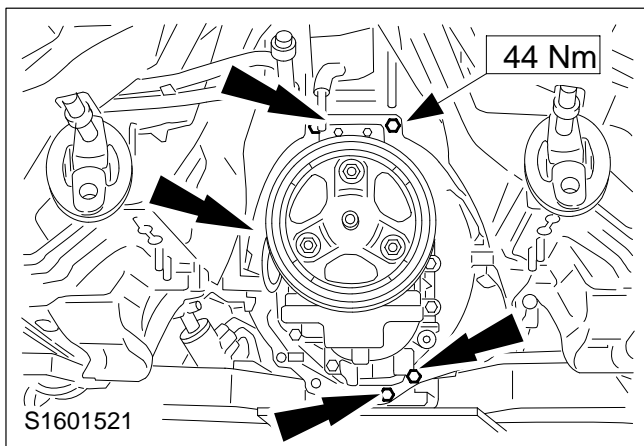
49. Remove the trolley jack.

50. Detach the engine lifting bracket.

NOTE: Only when the engine is being installed without the transmission.

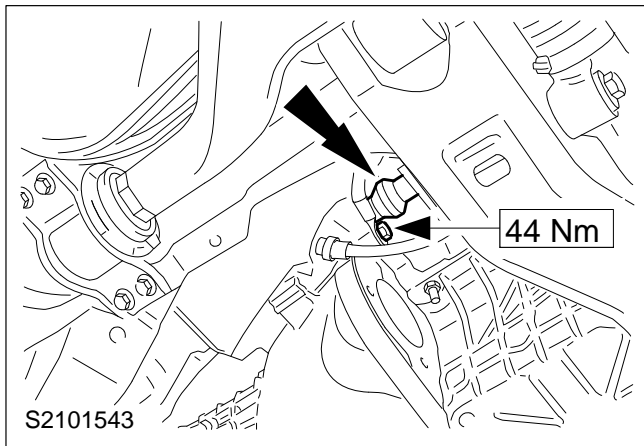
51. Attach the engine to the transmission.

Attach the bracket for the hydraulic clutch pipe.



52. Attach the right and left-hand engine mountings to the axle housing.

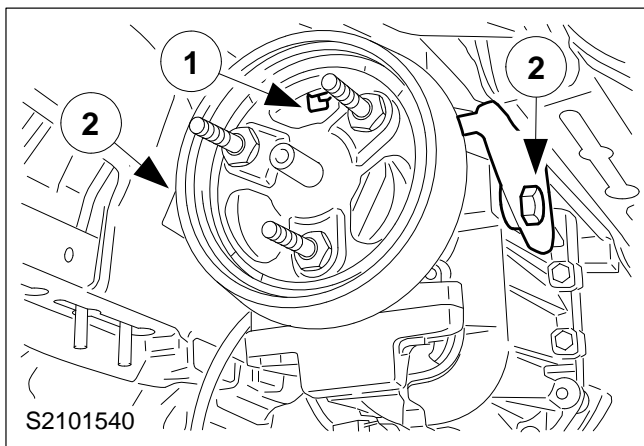
53. Locate the transmission jack in position.



54. Connect the line of the hydraulic clutch operating mechanism.

55. Connect the transmission earth lead.

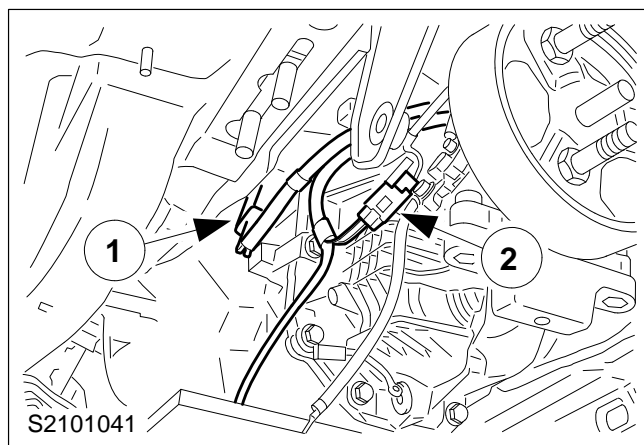
Tighten the flange bolt.



NOTE: Only when the engine is being installed with the transmission.

56. Attach the gearshift support bracket to the transmission.

- 1 Locate the gearshift linkage in position and attach it to the coupling.
- 2 Tighten the two bolts.

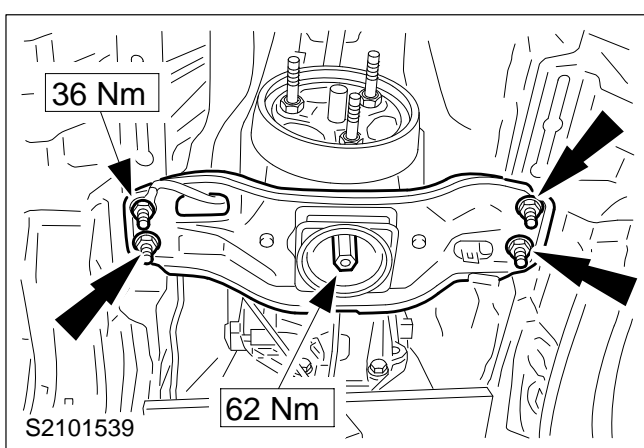


NOTE: Only when the engine is being installed with the transmission.

57. Connect the plugs.

- 1 Reversing light switch.
- 2 VS sensor

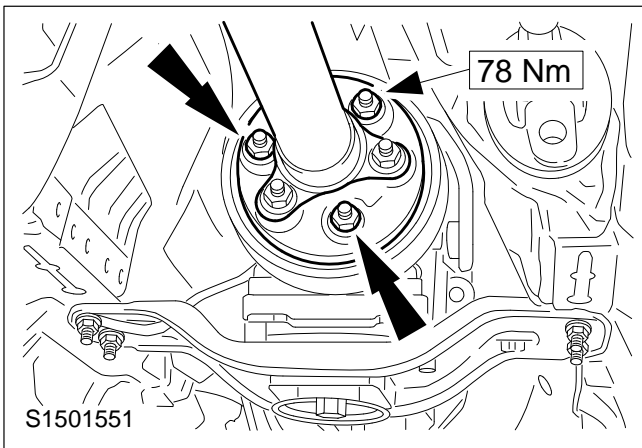
Route the wiring loom.



NOTE: Only when the engine is being installed with the transmission.

58. Attach the transmission crossmember to the floor assembly.

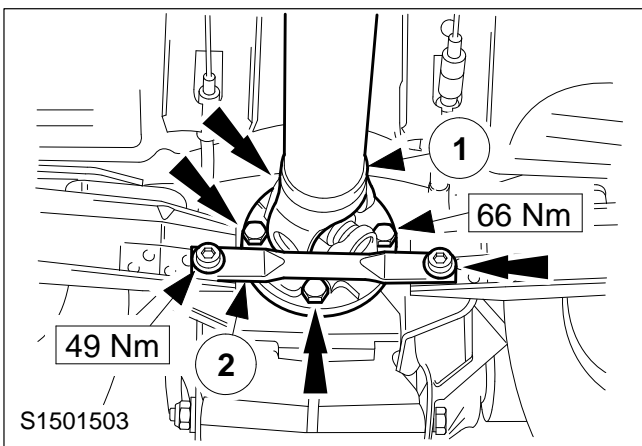
59. Remove the transmission jack.



NOTE: Only when the engine is being installed with the transmission.

60. Attach the driveshaft to the vibration damper.

- Loosely bolt the centre bearing to the floor assembly.

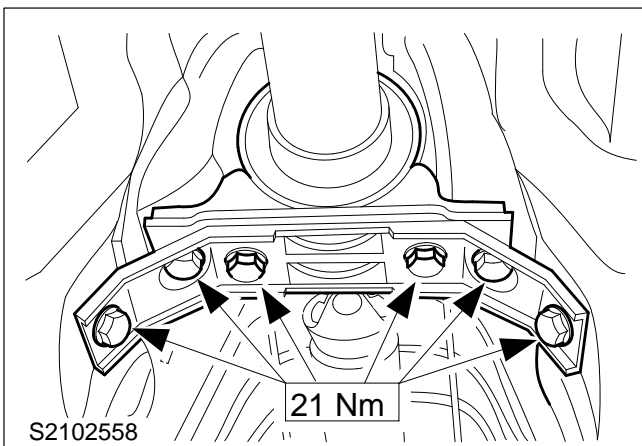


CAUTION: Different length bolts are fitted to the driveshaft for fine balancing. Note the installation markings on the driveshaft and the bolts.

61. Attach the driveshaft to the rear axle flange.

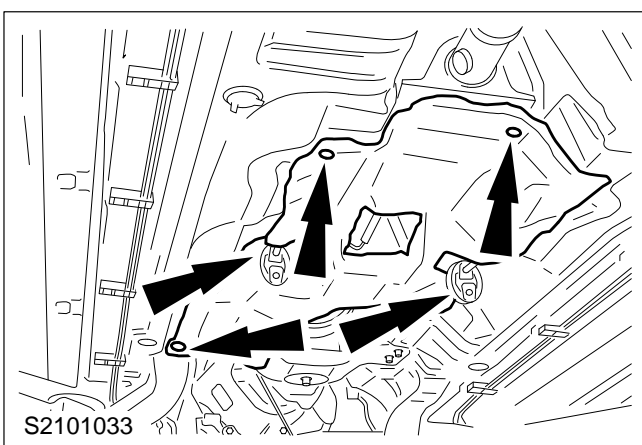
NOTE: The transverse brace is not fitted on vehicles built from Jan '96.

- 1 Driveshaft
- 2 Attach the transverse brace.



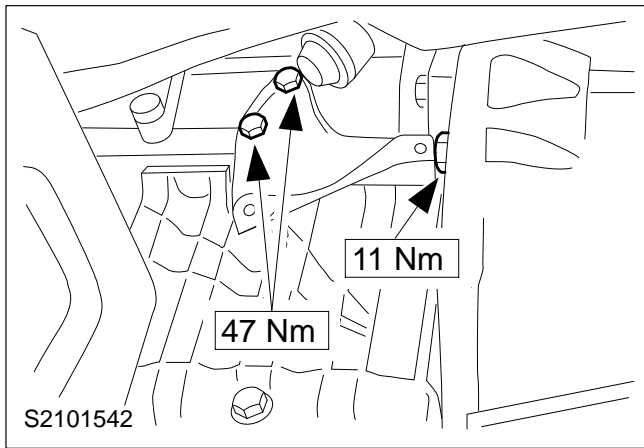
NOTE: Only when the engine is being installed with the transmission.

62. Align the centre bearing so that it is free of stress and tighten the bolts.



NOTE: Only when the engine is being installed with the transmission.

63. Fit the exhaust system heat shield.

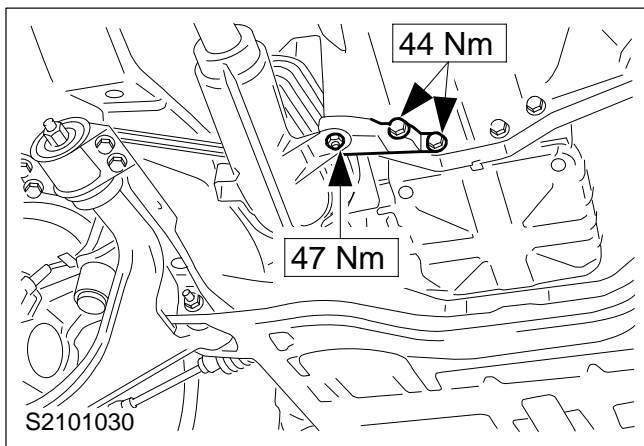


NOTE: Only when the engine is being installed without the transmission.

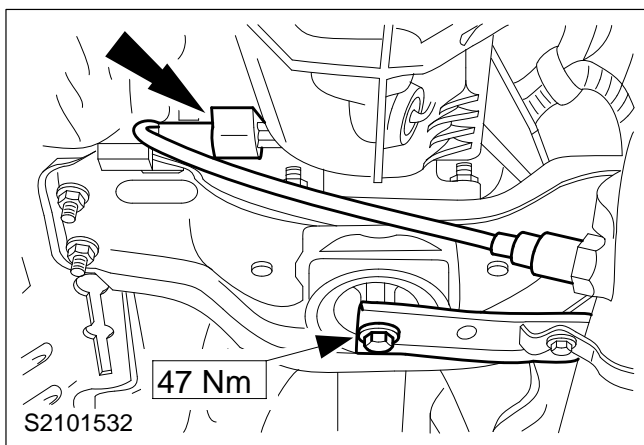
64. Attach the exhaust bracket to the engine.

65. Secure the adaptor plate.

66. Hook the exhaust system into its rubber insulators.

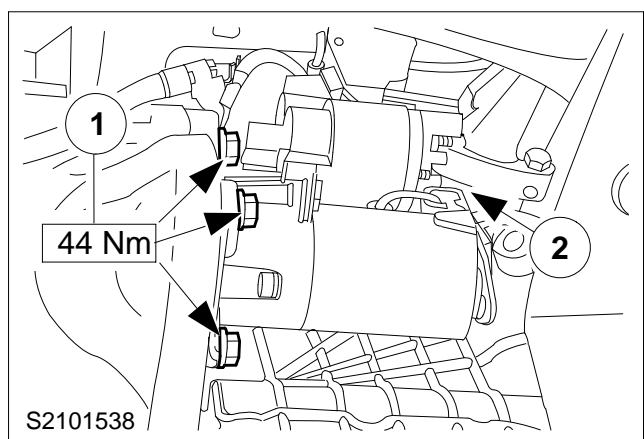


67. Attach the exhaust bracket to the transmission.



68. Attach the exhaust bracket to the transmission crossmember.

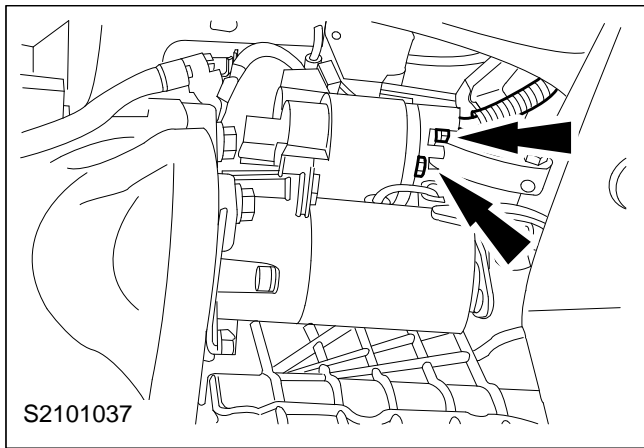
Connect the HO2S plug and clip it in place.



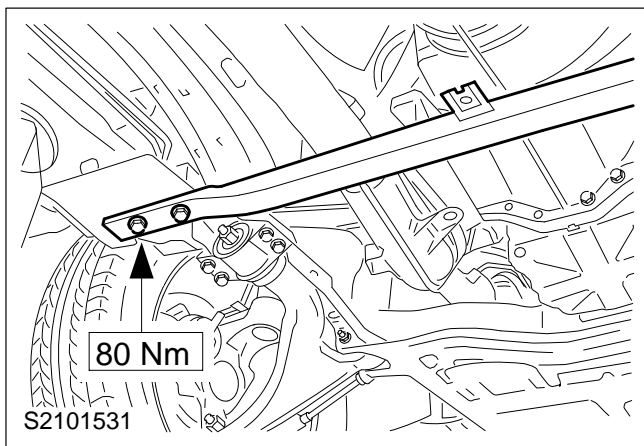
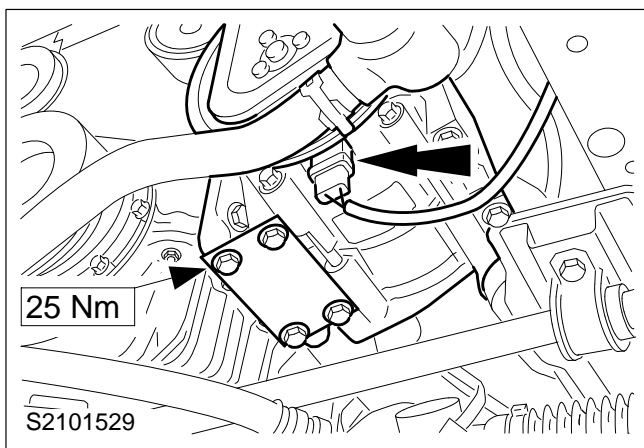
69. Fit the starter motor.

1 Tighten the flange bolts.

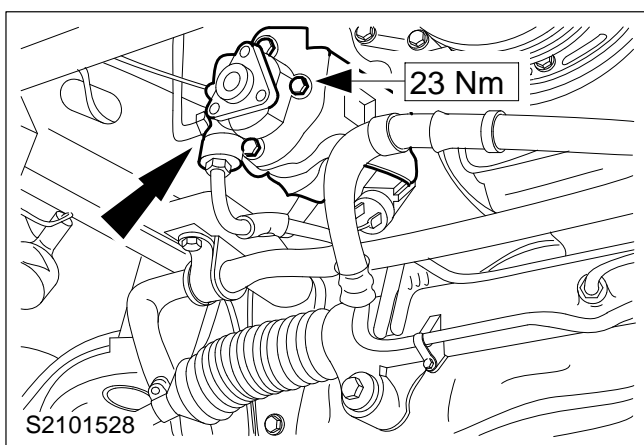
2 Secure the starter motor bracket.

**70. Connect the starter motor.**

Tighten the two nuts.

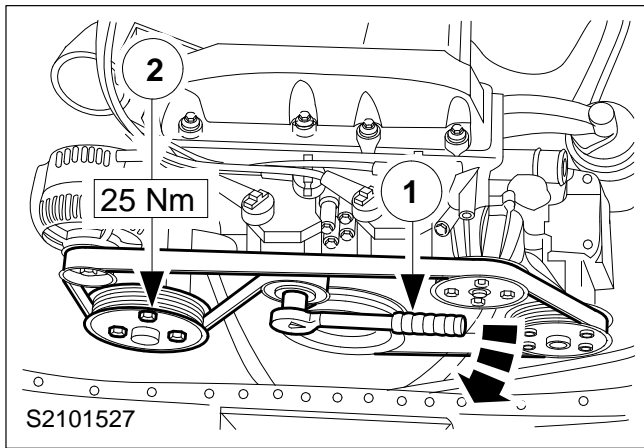
**71. Attach the front axle reinforcing bar (left-hand side shown).****72. Attach the rear engine undershield (if present).****73. Attach the air conditioning compressor.**

Connect the plug for the magnetic clutch and clip it in place.

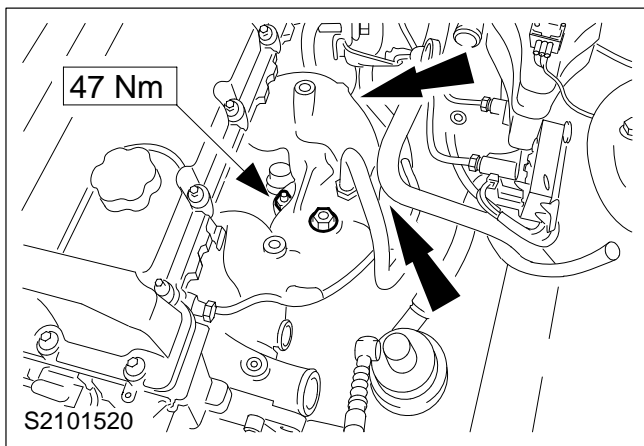
**74. Fit the power steering pump.**

NOTE: Insert the bolts with thread locking compound (SDM-M4G9107-A).

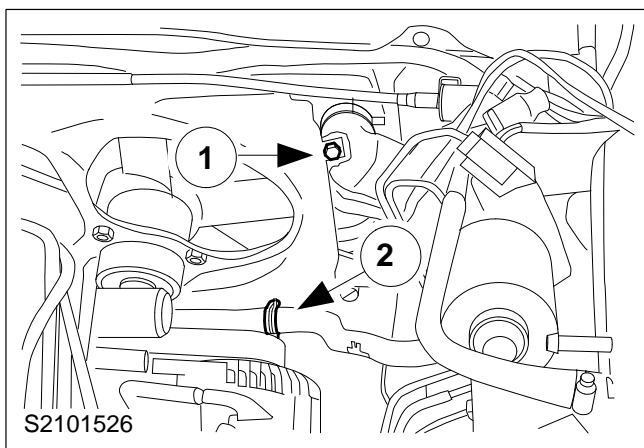
- Screw in the three bolts from the front and the single bolt from the rear.
- Lower the vehicle.

**75. Fit the power steering pump (continued).**

- 1 Slacken the tensioning pulley by turning it clockwise and fit the belt.
- 2 Tighten the belt pulley.

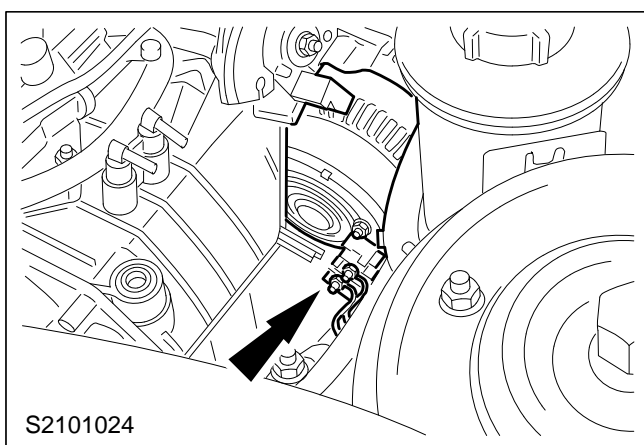
**76. Attach the catalyst to the exhaust manifold (four nuts).**

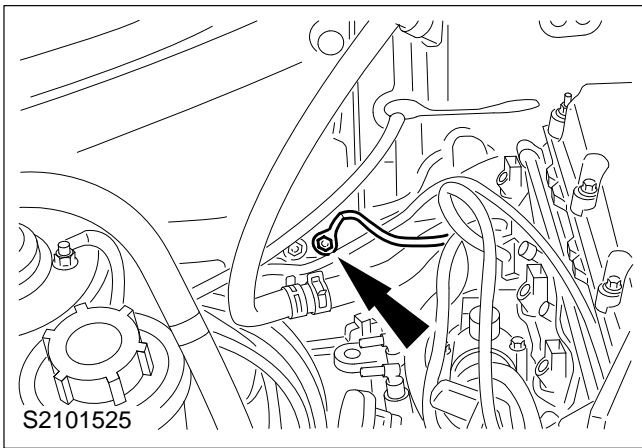
Connect the plug to the HO2S sensor.

**77. Attach the air baffle and fan motors to the radiator.**

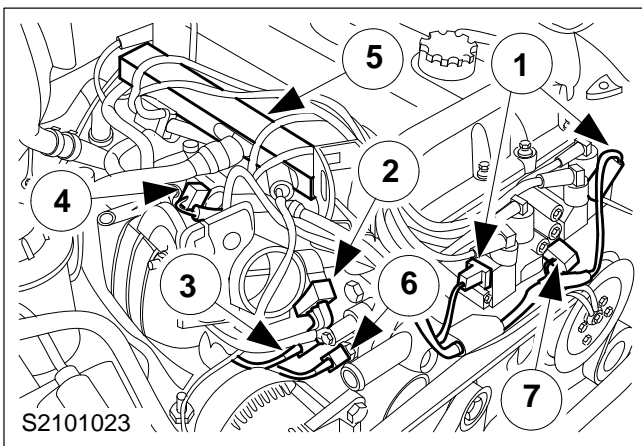
Connect the two fan motor plugs.

- 1 Screw on the two nuts.
- 2 Hook the coolant hose in place.

**78. Connect the alternator.**

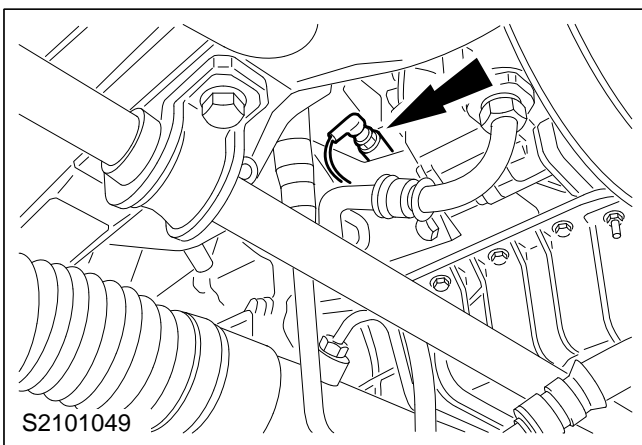


79. Attach the earth lead to the bulkhead.

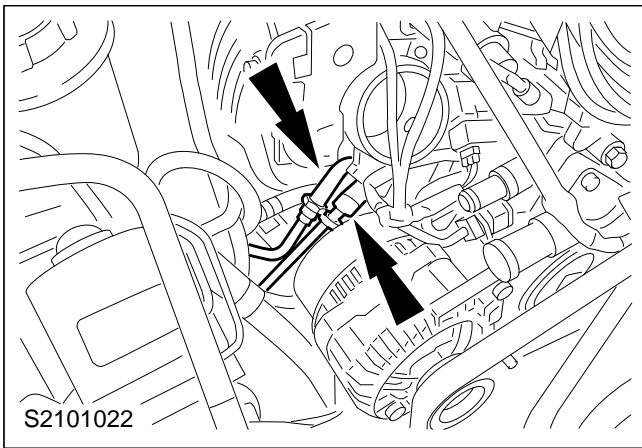
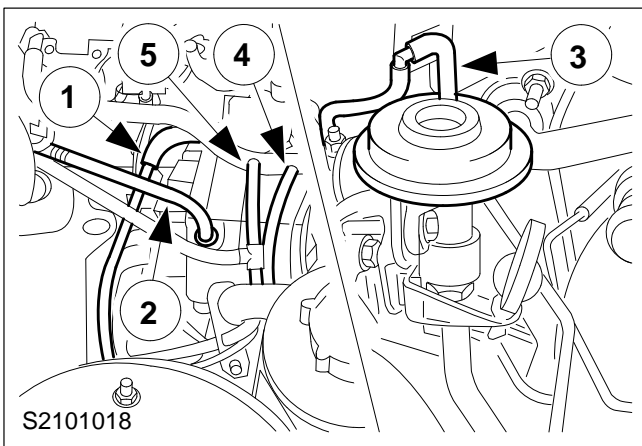


80. Connect the engine management multiplugs.

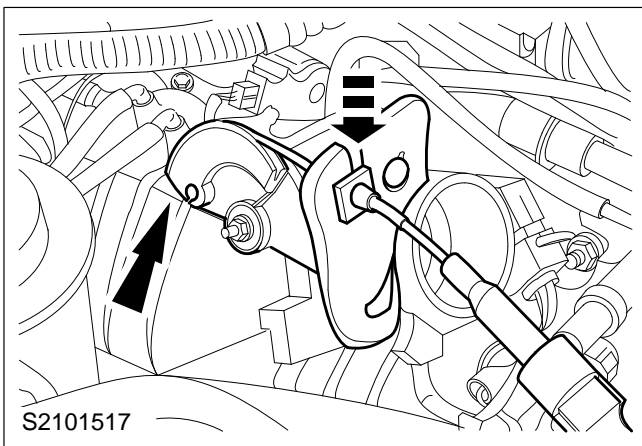
- 1 To the DIS ignition coils.
- 2 To the TP sensor.
- 3 To the ECT sensor.
- 4 To the IAC sensor.
- 5 To the injector wiring rail.
- 6 To the coolant temperature gauge sender unit.
- 7 To the noise suppression capacitor (if fitted).



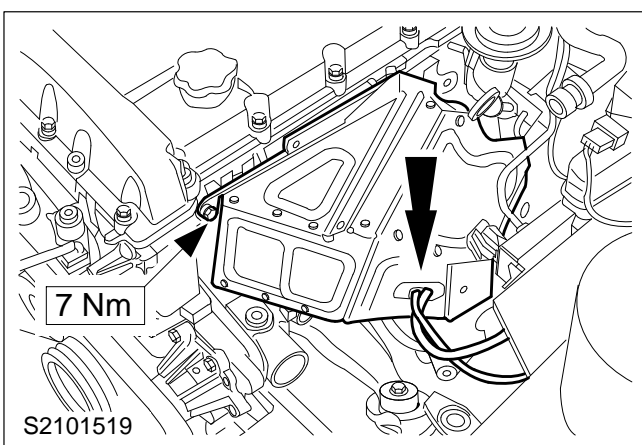
81. Connect the multiplug to the oil pressure switch (shown from below).

**82. Connect the fuel lines.****83. Connect the vacuum hoses.**

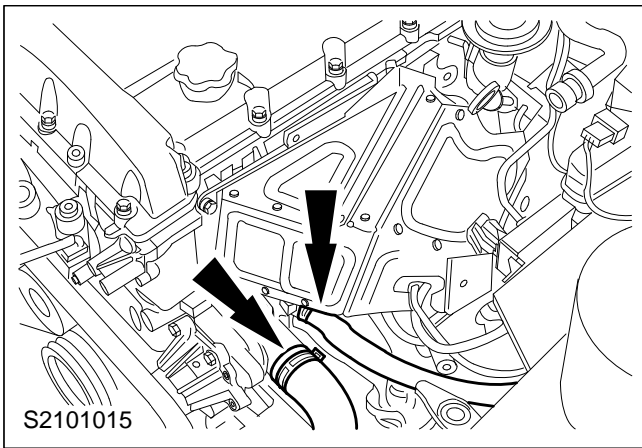
- 1 From the IAC sensor.
- 2 From the brake servo.
- 3 From the EGR valve.
- 4 From the EGR system vacuum controller (CVT).
- 5 From the EVAP system valve.

**84. Attach the accelerator cable.**

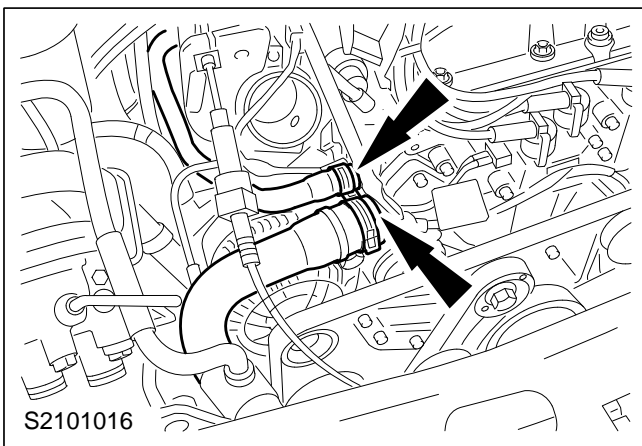
- Hook the accelerator cable in place.
- Fit the accelerator cable clip in the bracket.

**85. Attach the exhaust manifold heat shield.**

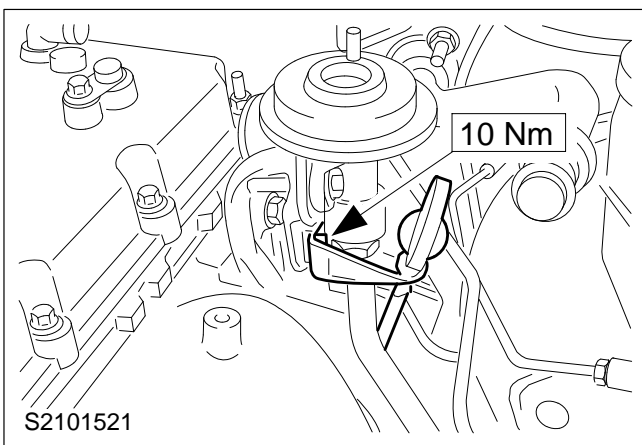
Connect the vacuum hoses to the DPFE sensor.



86. Attach the coolant hoses to the coolant pump.



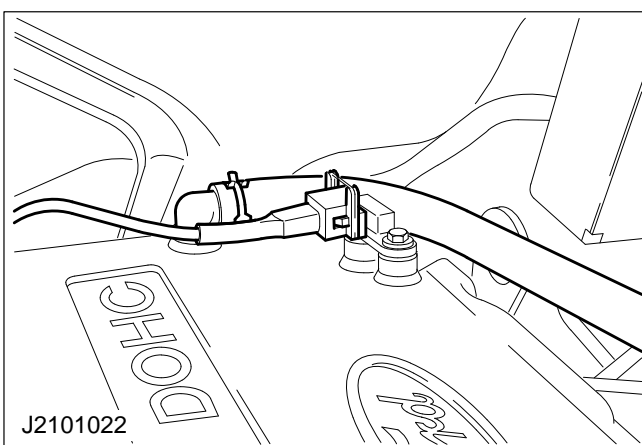
87. Attach the coolant hoses to the thermostat housing.



NOTE: Only when the engine is being installed without the transmission.

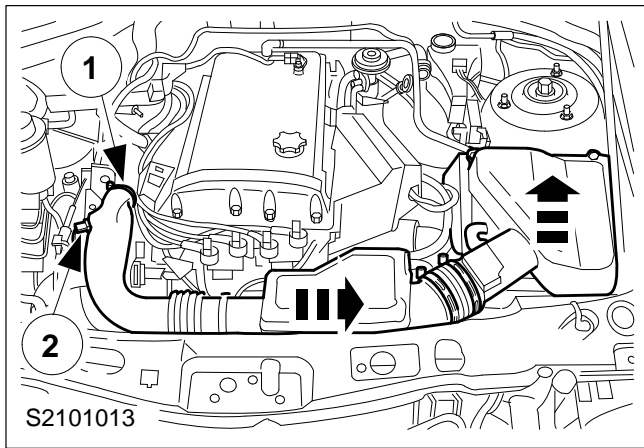
88. Install the oil dipstick tube.

Fit the oil dipstick bracket.

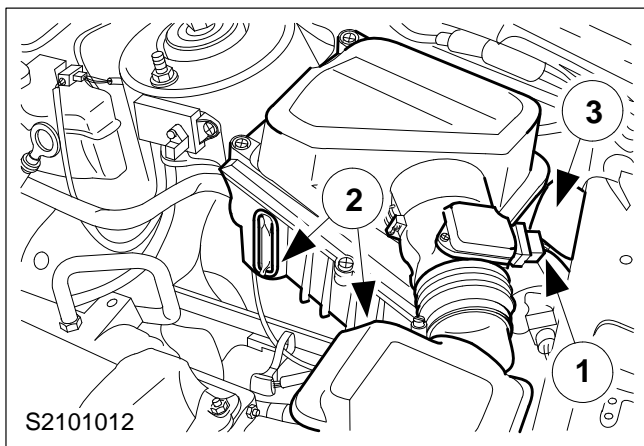


89. Connect the engine breather hose.

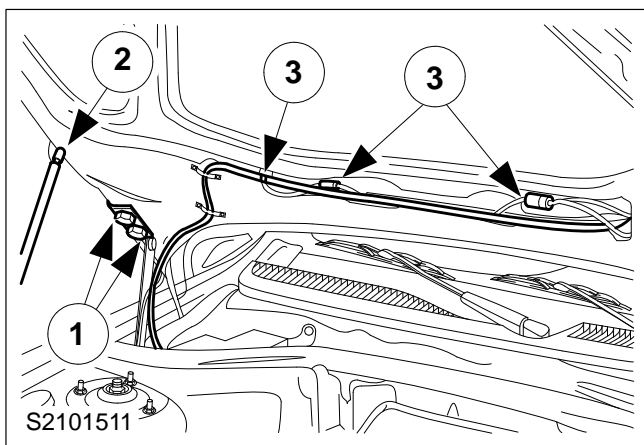
90. Connect the plug to the CMP sensor.

**91. Connect the intake pipe.**

- 1 Position the intake pipe ready for installation and tighten the hose clip.
- 2 Connect the IAT sensor plug.

**92. Connect the intake pipe (continued).**

- 1 Connect the MAF sensor plug.
- 2 Hook the rubber retainers in place.
- 3 Connect the air intake.

**93. Attach the hood.**

- 1 Screw in the hood bolts.
Align the hood.
- 2 Clip the hood hydraulic struts in place.
- 3 Connect the hose and the plug of the washer system and clip them in place.
Attach the hood noise-damping matting.

94. Finishing operations:

- Tighten the blanking plug and top up the coolant.
- Check the engine oil level and rectify as necessary.
- Connect the battery earth lead.
- Check the routing of the vacuum hoses and the wiring and secure them with cable ties.
- Enter the radio keycode. Reprogramme the preset radio stations.
- Reset the clock.
- Carry out a road test to enable the PCM to gather data.
- Check the fluid levels and rectify as necessary.
- Check the engine and cooling system for leaks.
- Attach the engine undershield.